LG SwitchGear 24kV

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LG Industrial Systems

TÜV CERT
ISO 9001

LG 24kV METAL CLAD SWITCHGEAR

GMH-V20 / GSH-V20

LG GMH, GSH-V20 Series Switchgear using a Vacuum Circuit Breaker (VCB) is the metal-clad type in compliance with IEC, ANSI and JEM standards, and is designed for general power distribution systems with rated voltage of 24kV.

TÜV CERT

CERTIFICATE

The TÜV CERT Certification Body of TÜV Rheinland Sicherheit und Umweltschutz GmbH

hereby certifies in accordance with TÜV CERT procedures that

LG Industrial Systems Co., Ltd.

#736, Osan-Dong, Osan-City, Gyeonggi-Do, Republic of Korea

has established and applies a quality system for

Design & Manufacturing of Electrical Power Distribution & Control Systems and Ultra-High Voltage Switchgear

An audit was performed,

Report No. **3284**

Proof has been furnished that the requirements according to

DIN EN ISO 9001

are fulfilled.

The certificate is valid until **October 1999**

Certificate Registration No. **09 100 3284**

TGA ZM-28-96-00

Cologne, 20.02.1997

TÜV Rheinland

TÜV CERT Certific...
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FEATURE

COMPACT AND MODULIZED DESIGN

- Standard module for each circuit / Shorten delivery and construction.
- Sufficient Function.
- Human engineering for measuring and indication.

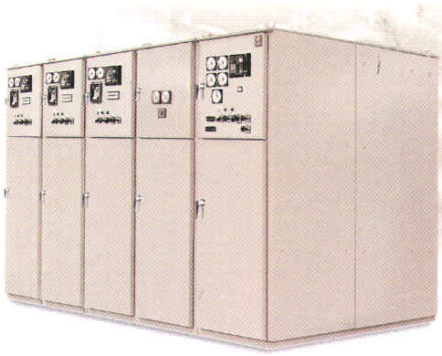
SAFETY DESIGN

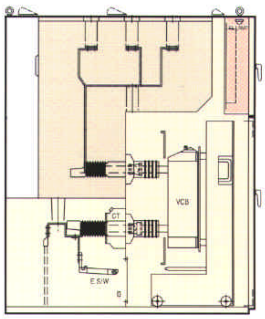
- Prevents expansion of internal arc fault.
- Mechanical interlocks.
- Complies with IEC, ANSI and JEM.

MAINTENANCE AND INSPECTION

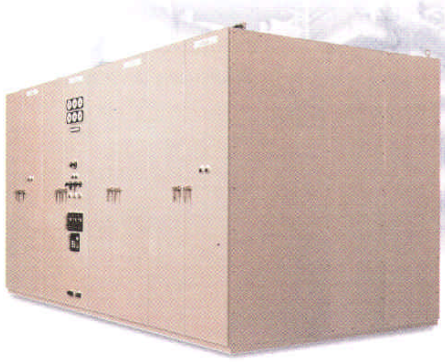
- Minimal maintenance and inspection with simple and unique design. Special circuit breaker.
- Inspect wear of contact of circuit breaker.

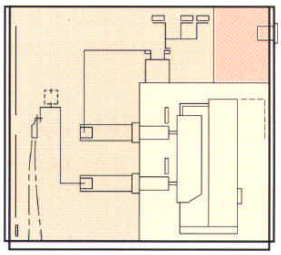
GMH-V20





GSH-V20





STANDARD RATINGS

DESCRIPTION		GMH-V20 MCSG TYPE	GSH-V20 GENERAL USE
Circuit Breaker		VCB	
Rated Voltage (kV)		24	
Rated Insulation Level	Power Frequency / 1min. (kV)	50	
	Impulse / 1.2 x 50μs (kV)	125	
Rated Frequency (Hz)		50 / 60	
Rated Normal Current for Busbar (A)		630, 1250, 1600, 2000	
Rated Short-time Withstand Current (kA / 1 sec. or 3 sec.)		12.5, 25	
Rated Peak Withstand Current		2.5 times of rated short-time current	
Applied Standard		IEC 298, ANSI C37.20, JEM1425	

Note : Above standard ratings are based on IEC.
If case ANSI or JEM, ratings will be in accordance with relative standard.

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GMH-V20

- LG GMH-V20 is designed and manufactured in accordance with IEC and ANSI. Bushing type CT is applied for minimizing installation space.
- LG GMH-V20 is front door type and, circuit breaker can be removed for both test and run positions by a motor-driven facility.

STANDARD RATINGS

DESCRIPTION		GMH-V20
Circuit Breaker		VCB
Rated Voltage (kV)		24
Rated Insulation Level	Power Frequency / 1min. (kV)	50
	Impulse / 1.2 x 50μs (kV)	125
Rated Frequency (Hz)		50 / 60
Rated Normal Current for Busbar (A)		630, 1250, 1600, 2000
Rated Short-time Withstand Current (kA / 1 sec. or 3 sec.)		25
Rated Peak Withstand Current		2.5 time of rated short-time current
Circuit Breaker	Rated Current (A)	630, 1250, 2000
	Rated Interrupting Current (kA)	25
	Rated Making Current (kA)	63
Applied Standard		IEC 298, ANSI C37.20, JEM1425
Degree of Enclosure		IP 4X
Protection Barrier		IP 3X
Busbar System		Bare or Insulated

Note : Above standard ratings are based on IEC, ANSI or JEM, ratings will be in accordance with relative standard.

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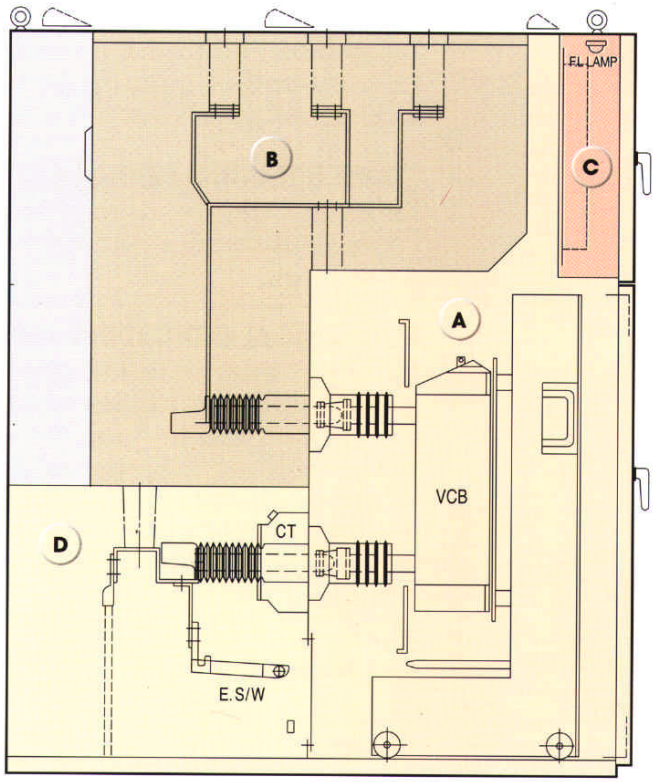
CONSTRUCTION

- As shown in Fig. the switchgear is composed of four (4) compartments: circuit breaker, busbar, cable and low voltage compartments.
- Applied equipment and parts are interchangeable.
- Cubicle is designed in accordance with IEC and ANSI standards.
- Provides extension of internal arc fault.
- Automatic safety shutters of busbar and circuit spouts are provided to prevent accidental contact to the live parts.
- Provisions will be made to allow future addition of cubicles at either end of the switchgear.

SPECIFICATION OF STEEL PLATE

DESCRIPTION	STEEL PLATE (mm)
Frame	3.2t
Front Door	2.3t ~ 3.2t
Rear Door or Cover	2.3t
Top Plate	2.3t
Bottom Plate	2.3t ~ 3.2t
Internal Barrier	1.6t ~ 3.2t
Side Cover	2.3t



A CB COMPARTMENT
B BUSBAR COMPARTMENT
C LV COMPARTMENT
D CABLE COMPARTMENT

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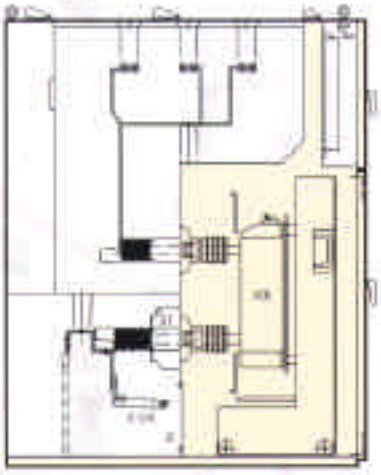
CB COMPARTMENT



1. Safety Shutter 2. Circuit Spouts

INTERNAL VIEW OF CB COMPARTMENT

1. Terminal 2. Closing Button
3. Tripping Button 4. Interlock Lever
5. Draw-out Lever 6. Counter

VCB (GVB TYPE)

The draw-out type VCB installed in GMH-V20 switchboard has the following three (3) positions within the compartment:

- Run (connected) Positions
  Main isolating contacts and auxiliary circuits are connected.
- Test postion
  Main isolating contacts are disconnected and auxiliary circuits are disconnected.
- Disconnected Position
  Main isolating contacts and auxiliary circuits are disconnected.

SAFETY INTERLOCK

The following mechanical interlocks are provided for safety.

- The circuit breaker cannot be withdrawn or inserted to / from the service position while it is closed.
- The circuit breaker cannot be closed while it is being withdrawn or inserted.

GROUND

The circuit breaker is automatically grounded through a ground shoe connected to the ground bus directly. The ground shoe ensures the grounding between the test and service positions of the breaker.

SAFETY SHUTTER

Busbar and circuit spout orifices and fitted with automatically operated safety shutters of resin, and close orifices by withdrawl of the breaker. For testing and inspection, each shutter can be individually operated by hand, and looked with a latch mechanism will be automatically restored, when the circuit breaker is inserted to the service position.

OPERATING MECHANISM

The operating mechanism is mechanically and electrically trip free. The motor-operated spring-charged type closing mechanism and shunt trip coil are provided with an anti-pumping device.

STABLE BREAKING PERFORMANCE

The excellent insulation recovery characteristics of the vacuum interrupter allows quick reaction to both small and massive short circuit current.

MECHANICAL INDICATORS AND FACILITIES

The circuit breaker has the following mechanical indicators and facilities:

- "Open" / "Closed" indicator showing closed or open condition of the circuit breaker.
- "Spring charged" / "Spring free" for closing spring.
- Operation counter.
- "Open" / "Close" push button.
- Contact wear indicator viewable from the front of the circuit breaker.

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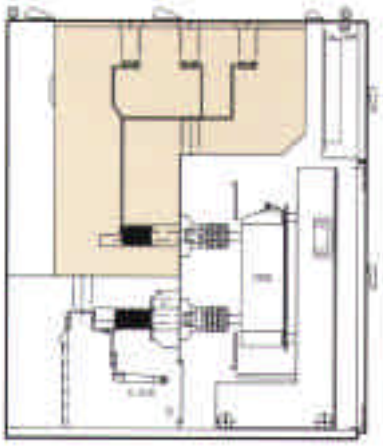
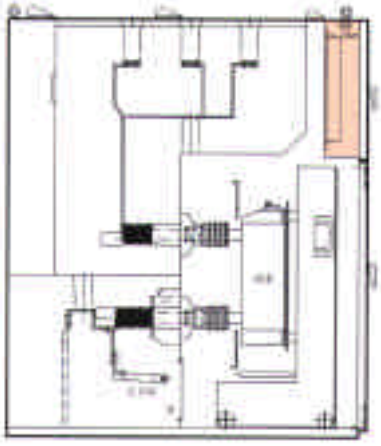
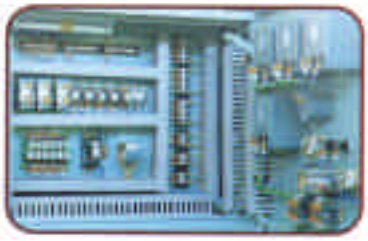
BUSBAR COMPARTMENT



- The busbars are of hard-drawn high-conductivity copper, and can be insulated with epoxy-coating except connections.
- Connections are covered with easily removable insulated cover.
- Insulation can withstand a rated voltage for 1 minute as well as a temperature rise caused by short-circuited currents.

LV COMPARTMENT





L.V. compartment is equipped with a hinged front door on top of the breaker compartment. Indicating meters, protection relay, switches and lamps etc. are installed on the door, and terminal blocks.

AUXILIARY WIRING

Auxiliary wiring sized 1.25mm.sq. and 2mm.sq.are 600V grade PVC insulated wire (KIV) wiring method is as follows:

DESCRIPTION		STANDARD SPEC.
Wiring Method		Resin Cable Duct
Used Wire		600V, KIV
Size	General	1.25mm²
	CT, PT, 2nd, 3rd	2mm²
Color	General	Gray
	Ground	Green
Termination	Ring type lug	
	Numbered ferrule	
	Color ring	

Note : 1.Size and Color are variable up on request.
2.Wire number will be added by request. (opt.)

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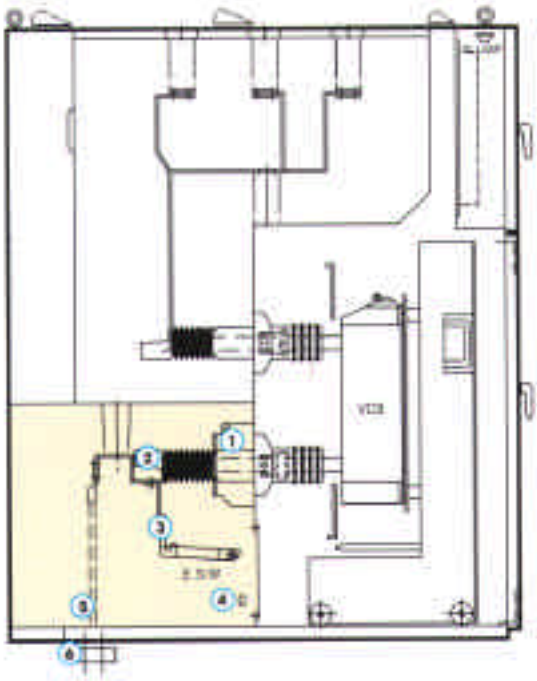
CABLE COMPARTMENT



Current Transformer

CTs are the epoxy resin molded type. The bushing type CTs are integrated with circuit spouts of the circuit breaker.

CABLE TERMINATION

Sufficient space are provided for cable termination and entry. Access can be obtained by removing the bolted cover from the rear of the unit.

CABLE HOLE PACKING

To finish easily for cabling work, install the neoprene cable hole packing on enterance.

POTENTIAL TRANSFORMER

The PTs are resin mold type with withdrawable primary fuses.

PRESSURE RELIEF FLAP (OPTION)

OTHER ACCESSORIES

DESCRIPTION	STANDARD SPEC.
Space Heater	AC 110V / 220V 80W
Lighting Fixture	Only at L.V. Compartment
Specical Tool	1 set for line-up group
Bolts & Nuts	Necessary Quantity

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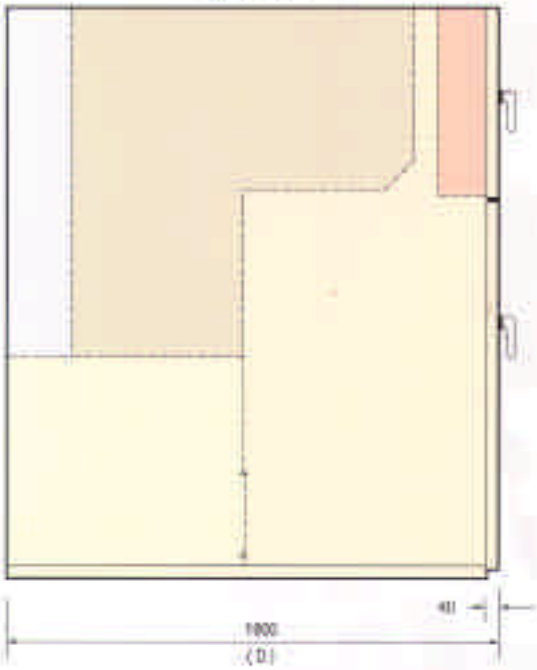
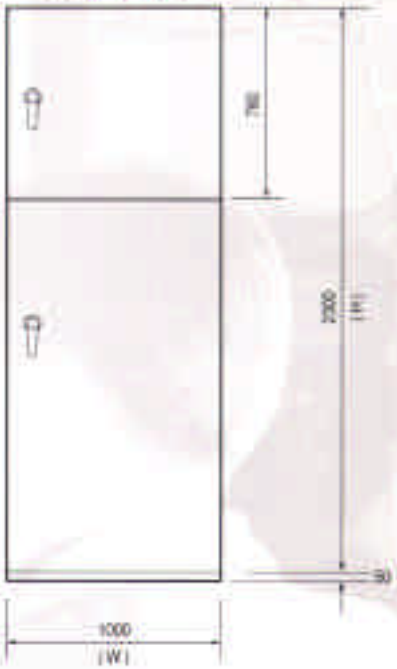
DIMENSIONS

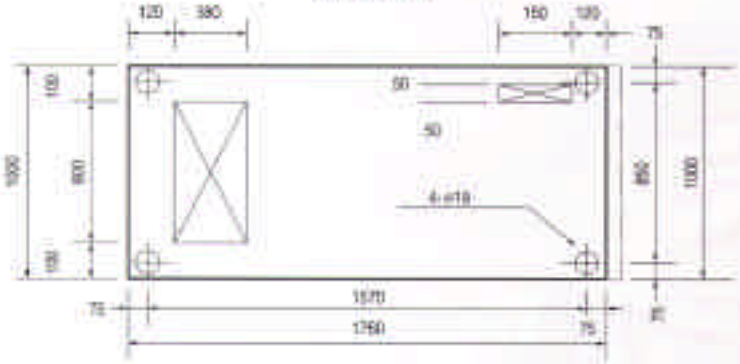
SIDE VIEW



FRONT VIEW



BASE PLAN



TYPE	RATED VOLTAGE (kV)	RATED SHORT-TIME CURRENT (kA)	RATED CURRENT (A)	DIMENSION (mm)		
				W	D	H*1
GMH-V20	24	25	630 1250 2000	1000	1800(*2) (1960)	2300

Note : *1.The dimensions H of 2300 excluded the channel base.
*2.If the earthing switch is provided the dimensions D of 2000 to be applied.

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GSH-V20

- LG GSH-V20 is designed and manufactured in accordance with JEM, IEC.
- GSH-V20 can apply VCB, GCB and MOCB but, our standard is VCB.
- GSH-V20 can be applied to a single bus system or double bus system.

STANDARD RATINGS

DESCRIPTION		GMH-V20
Circuit Breaker		VCB (*1)
Rated Voltage(kV)		24
Rated insulation Level	Power Frequency / 1min. (kV)	50
	Impulse / 1.2 x 50μs (kV)	125
Rated Frequency (Hz)		50 / 60
Rated Normal Current for Busbar (A)		400, 630, 800, 1250, 1600, 2000
Rated Short-time Withstand Current (kA / 1 sec. or 3 sec.)		12.5, 25
Rated Peak Withstand Current		2.5 times of rated short-time current
Circuit Breaker	Rated Current (A)	630, 1250, 2000
	Rated Interruping Current (kA)	12.5, 25
	Rated Making Current (kA)	31.5, 63
Applied Standard		IEC 298, JEM1425
From (JEM 1425)		CW, MW (G), PW (G)

Note : *1. Minimum space for the rear is 1300mm with the installed rear door.

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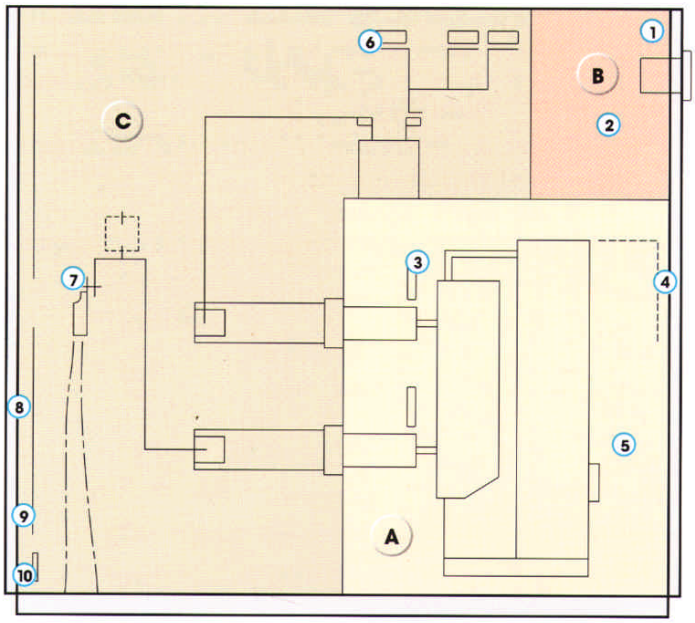
CONSTRUCTION

LG GSH-V20 has separated 3 compartment:

- Applied equipmet and part are interchangeable.
- Cubicle is classified to E, F2 and G type in accordance with JEM.
- Automatic is safety shutters of busbar and circuit spouts are provided to prevent accidental contact with live parts.
- Provisions are made to allow future addition of cubicles at either end of the switchgear.

SPECIFICATION OF STEEL PLATE

DESCRIPTION	STANDARD SPEC.
Frame	3.2t
Front Door	2.3t ~ 3.2t
Rear Door	2.3t
Top Plate	2.3t
Bottem Plate	2.3t
Internal Barrier	1.6t ~ 3.2t
Side Cover	2.3t



1. Instrument Panel
2. L.V. Compartment
3. Shutter
4. Front Door
5. CB Compartment
6. Main Bus
7. Freeder Bus
8. Rear Door
9. Protection Cover
10. Ground Bus

A CB COMPARTMENT

B LV COMPARTMENT

C BUSBAR / CABLE COMPARTMENT

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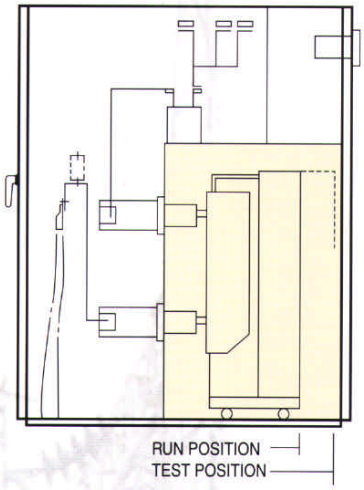
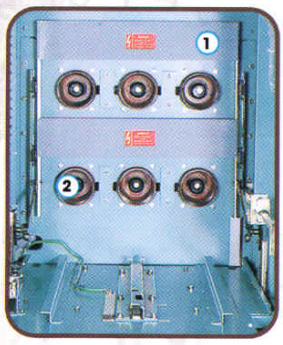
CB COMPARTMENT





1. Safety Shutter 2. Circuit Spouts

INTERNAL VIEW OF CB COMPARTMENT

1. Terminal 2. Closing Button
3. Tripping Button 4. Interlock Lever
5. Draw-out Lever 6. Counter

VCB (GVB TYPE)

The draw-out type VCB installed in GSH-V20 switchboard has the following three (3) positions with in the compartment:

- Run (connected) position
  Main isolating contacts and auxiliary circuits are connected.
- Test position
  Main isolating and auxiliary circuits are connected.
- Disconnected position
  Main isolating contacts and auxiliary circuits are disconnected.

SAFETY INTERLOCK

The following machanical interlocks are provided for safety:

- The circuit breaker cannot be with drawn or inserted to/from the service position while it is closed.
- The circuit breaker cannot be closed while it is being withdrawn or inserted.

GROUND

The circuit breaker is automatically grounded through an ground shoe connected to the ground bus directly.
The ground shoe ensures the grounding between the test and services positions of the breaker.

SAFETY SHUTTER

Busbar and circuit spout orifices are fitted with automatically operated safety shutters of resin and close orifices by withdrawl of the breaker. For testing and inspection, each shutter can be individually operated by hand, and locked with a latch mechanism will be automatically restored, when the circuit breaker is inserted to the "service" position.

MECHANICAL INDICATORS AND FACILITIES

The circuit breaker has the following mechanical indicators and facillities:

- "Open" / "Closed" indicator showing closed or open condition of the circuit breaker.
- "Spring charged" / "Spring free" for closing spring.
- Operation counter.
- "Open" / "Close" push button.
- Contact wear indicator viewable from the front of the circuit breaker.

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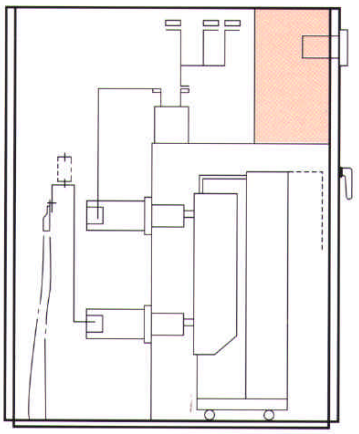
LV COMPARTMENT



OPERATING MECHANISM

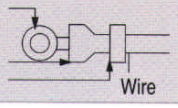
The operating mechanism is mechanically and electrically trip free. The motor-operated spring-charged type closing mechanism and shunt trip coil are provided with an anti-pumping device.

STABLE BREAKING PERFORMANCE

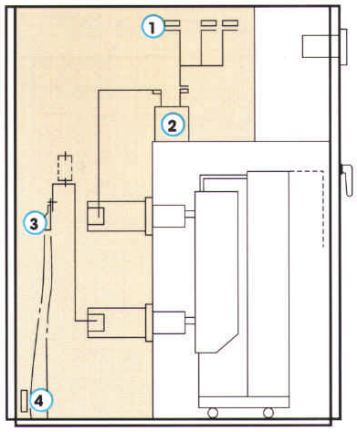
The excellent insulation recovery characteristics of the vacuum interrupter allows quick reaction to both small and massive short circuit current. L.V. compartment is equipped with a hinged front door on top of the breaker compartment. Indicating meters, protection relay, switches and lamps etc. are mounted on the door, and terminal blocks aux. relay and aux. devices are mounted in the compartment.

AUXILIARY WIRING

Auxiliary wiring sized 1.25mm.sq. and 2mm.sq. are 600V grade PVC insulated wire (KIV) Wiring method is as following:

DESCRIPTION		STANDARD SPEC.
Wiring Method		Resin Cable Duct
Used Wire		600V, KIV
Size	General	1.25mm²
	CT, PT, 2nd, 3rd	2mm²
Color	General	Gray
	Ground	Green
Termination	Ring type lug	 Wire
	Numbered ferrule	
	Color ring	

BUSBAR & CABLE COMPARTMENT



1. Main Busbar
2. CT
3. Cable Terminal Lug (Option)
4. Ground Bar

- The busbars are of hard-drawn high-conductivity copper.
- Busbar have sufficient strenght against rated short-time current.

CURRENT TRANSFORMER

CTs are the epoxy resin molded type and, have various type in accordance with customer's request.

CABLE TERMINATION

Sufficient space are provided for cable termination and entry. Access for maintenance working can be obtained by opening rear door. Bus compartment and cable compartment can be deviced by customer's request.

PHASE AND POLARITY OF CONTROL OPERATING CABLE

ITEM	STANDARD SPEC.					
	AC				DC	
Color Distinction	Phase R (A)	Phase S (B)	Phase T (C)	Neutral	Positive	Negative
	Red	White	Blue	Black	Red	Black

OTHERS

PT (GPT) TRUCK (OPTION)

The PTs are resin mold type and, withdrawable type also available.

OTHER ACCESSORIES

DESCRIPTION	STANDARD SPEC.
Space Heater	AC 220V 80W
Lighting Fixture	Only at LV compartment
Special Tool	1 set for 1 line-up group
Bolts & Nuts	Necessary Quantity

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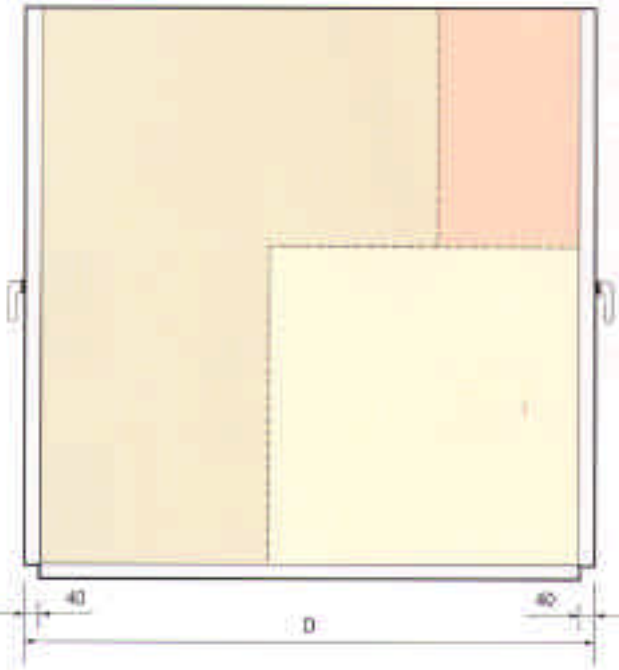
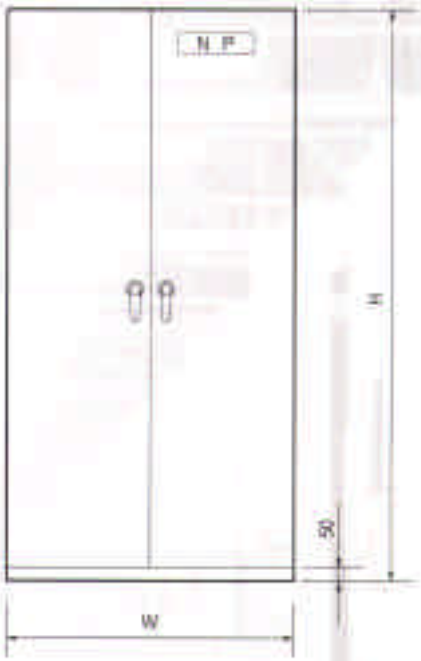
DIMENSIONS

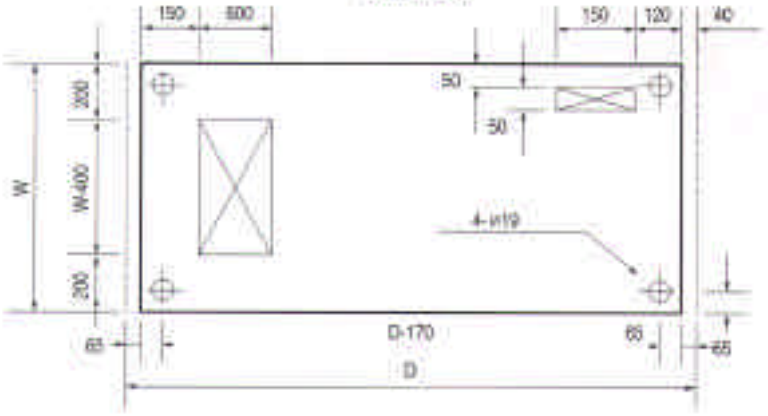
SIDE VIEW



FRONT VIEW



BASE PLAN



TYPE	RATED VOLTAGE (kV)	RATED SHORT-TIME CURRENT (kA)	DIMENSION (mm)					
			Width (W)				Depth (D)	Hight (H)
			PF	MOF & LA	PT (GPT)	CB		
GSH-V20	24	12.5 25	1200 (1400)*1	1300	1200	1200	2500	2350

Note : *1.Minimum space for the rear is 1300mm with the installed rear door.

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LG constantly endeavors to improve our products, so that information in this catalog is subject to change without notice.

LG Industrial Systems Co., Ltd.

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